Genomic DNA Assay User Guide

For LabChip GX Touch/GXII Touch

CE

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PN CLS140166, Rev. C

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Specifications

Assay Specifications[1]

Table 1. Assay Specifications

Sizing Range	50 - 40,000+ bp	
Sizing Accuracy	± 20%	Up to 10 kb, based on ladder
Sizing Precision	20% CV	
Quantitation Range	0.2 - 5 ng/µL	For water as sample buffer. Final concentration after dilution
Sensitivity	0.1 ng/µL	S/N > 3; intact Human Control gDNA
Quantitation Accuracy	± 30%	Based on PicoGreen quantitation of Human Control gDNA
Quantitation Precision	20% CV	Based on Human Control gDNA
Sample Volume Required	10 µL (minimum) 20 µL (recommended)	Requires a 384-well plate. A 96-well plate can be used but it requires a minimum of 20 µL and a low sip height
Samples per Chip Prep	48 or 24	Two workflows: one for ≤24 samples, one for ≤48 samples
Analysis Time	48 samples in 2.5 hrs	Walk-away time
Samples per Chip Reagent Kit	480	
Chip Reagent Kit Stability	3 - 9 months	

1. Human Control gDNA from intestine was purchased from BioChain (Hayward, CA).

Sample Conditions

Table 2. Sample Conditions

Additives	PerkinElmer recommends that BSA and detergents exceeding 0.05 mg/mL and 0.01% v/v (respectively) in concentration not be used. Higher concentrations can result in chip failure. In addition, non-aqueous solvents are not compatible with DNA LabChip protocols.
Particulates	All sample plates should be spun down prior to analysis. All buffers should be filtered with a 0.22 µm cellulose acetate filter.
Salt Concentration	Total salt concentration must not exceed 10 mM Tris. Higher salt concentrations and different ions may alter performance and reduce assay sensitivity.

Kit Contents

Storage: When not in use, store chips and reagents refrigerated at 4°C. Do not leave chips and reagents unrefrigerated overnight.

Kit contains enough reagents for 20 Small-batch or 10 Large-batch chip preparations. Up to 24 samples can be tested with a Small-batch chip preparation. Up to 48 samples can be tested with a Large-batch chip preparation.

Table 3. Genomic DNA Reagent Kit Contents, PN CLS760685

Reagent	Vial	Quantity
DNA Dye Concentrate	Blue	1 vial, 0.09 mL
Chip Storage Buffer	White	9 vials, 1.8 mL each
Genomic DNA Gel Matrix	Red	5 vials, 1.1 mL each
10X Genomic DNA Ladder	Yellow	1 vial, 0.26 mL
Genomic DNA Marker	Green	1 vial, 1.5 mL

Table 4. Consumable Items

Item	Supplier and Catalog Number	Quantity
Spin Filters	Costar, Cat. # 8160	10
Ladder Tubes	Genemate, Cat. # C-3258-1	20, 0.2 mL
Detection Window Cleaning Cloth	VWR, Cat. # 21912-046	1
Swab	ITW Texwipe®, Cat. # TX758B	3
Buffer Tubes	E&K Scientific, Cat. # 697075-NC	20, 0.75 mL

Table 5. DNA Extended Range LabChip

Item	Catalog Number
DNA Extended Range Chip (gDNA) for use with GX Touch/GXII Touch HT	Cat. # 760517
DNA Extended Range Chip (gDNA) for use with GX Touch/GXII Touch 24	Cat. # CLS138948

Safety Warnings and Precautions

WARNING!

For Research Use Only. Not recommended or intended for diagnosis of disease in humans or animals. Do not use internally or externally in humans or animals.

CAUTION

We recommend that this product and components be handled only by those who have been trained in laboratory techniques and that products are used in accordance with the principles of good laboratory practice. As all chemicals should be considered potentially hazardous, it is advisable when handling chemical reagents to wear suitable protective clothing such as laboratory overalls, safety glasses, and gloves. Care should be taken to avoid contact with skin or eyes. In case of contact with skin or eyes, wash immediately with water.

WARNING!

Dye Concentrate contains DMSO. S24/25: Avoid contact with skin and eyes.

Preparation Procedures

Additional Items Required

- 18 megohm, 0.22-µm filtered water (Milli-Q® or equivalent).
- 70% isopropanol solution in DI water.
- Bio-Rad Hard-Shell® 384-well Skirted PCR Plates, Cat # HSP-38XX (recommended).
- PerkinElmer Hard-Shell thin-wall 96-well skirted PCR plate (blue), Cat # 6008870 (recommended).

Note: *Allow the chip and reagents to equilibrate to room temperature for 20-30 minutes before use.*

Preparing the Gel-Dye Solution

Notes: *The Dye Solution contains DMSO and* ***must be thawed completely*** *before use.*

The dye is light sensitive. ***Do not expose the Dye solution or Gel-Dye to light for any length of time.*** *Keep the prepared Gel-Dye solution in the dark.*

One vial of Genomic DNA Gel Matrix (red cap 🔴) is good for 4 Small-batch or 2 Large-batch chip preparations. Up to 24 samples can be tested with a Small-batch chip preparation. Up to 48 samples can be tested with a Large-batch chip preparation.

1 Vortex the thawed Genomic DNA Dye Concentrate (blue cap 🔵) for 10 seconds before use.

2 Transfer 13.75 µL of Genomic DNA Dye Concentrate (blue cap 🔵) to 1 vial of Genomic DNA Gel Matrix (red cap 🔴).

3 Vortex the solution until it is well mixed and spin down for a few seconds.

4 Transfer the mixture into two spin filters (approximately 550 µL each).

5 Centrifuge at 9300 rcf for 7.5 minutes at room temperature.

6 Discard filters, label and date the tubes.

7 Store in the dark at 4°C. Use within 3 weeks.

Preparing the DNA Samples, DNA Ladder and the Buffer Tube

Sample Workflow

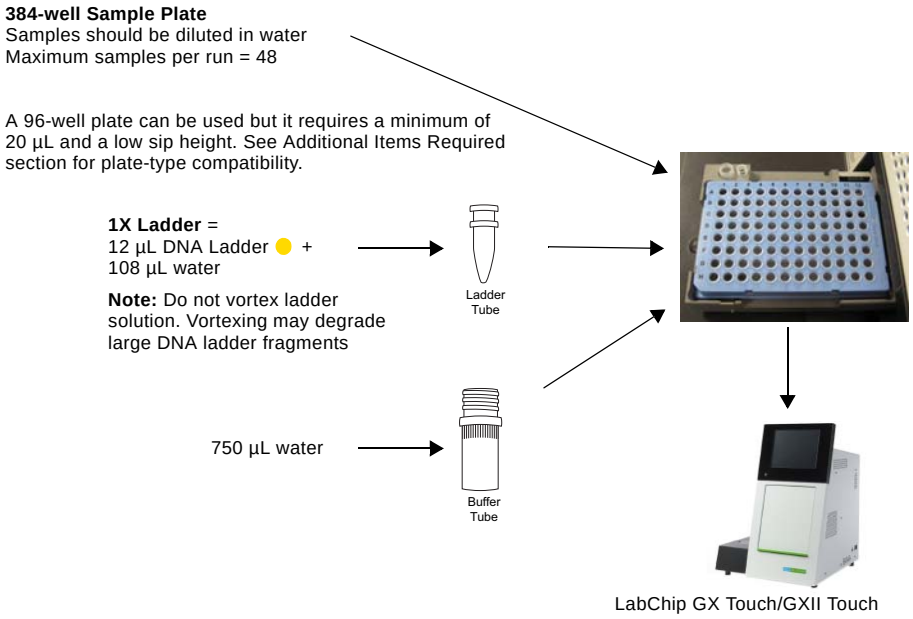
384-well Sample Plate
Samples should be diluted in water
Maximum samples per run = 48
A 96-well plate can be used but it requires a minimum of 20 µL and a low sip height. See Additional Items Required section for plate-type compatibility.
1X Ladder =
12 µL DNA Ladder
+
108 µL water
Note: Do not vortex ladder solution. Vortexing may degrade large DNA ladder fragments
Ladder Tube
750 µL water
Buffer Tube
LabChip GX Touch/GXII Touch

Figure 1. Sample Workflow.

1 In the provided 0.2 mL Ladder Tube, add 12 µL of Genomic DNA Ladder (yellow cap) to 108 µL water (Milli-Q® or equivalent). Mix thoroughly by pipetting the solution up and down a few times. Avoid creating air bubbles. Ensure there are no air bubbles in the Ladder Tube.

Note: *Do not vortex the ladder solution. Vortexing may degrade large DNA ladder fragments.*

2 Insert the Ladder Tube into the ladder slot on the LabChip GX Touch/GXII Touch instrument.

3 Prepare samples in 384-well plates. Add 2 µL of sample to 18 µL of water (Milli-Q® or equivalent). If sample volume is limited, 1 µL of sample can be added to 9 µL of water.

Notes: *Due to evaporation, samples prepared with 1 µL of sample and 9 µL of water should only be tested in Small-batch runs, ≤ 24 samples.*

Samples at concentrations from 0.2 to 5 ng/µL should be run undiluted.

Do not exceed 5 ng/µL final concentration in the well as this can clog the chip channels.

We recommend testing intact DNA at 2.5 ng/µL

4 Add 750 µL of water (Milli-Q® or equivalent) to the 0.75 mL Buffer Tube provided with the reagent kit. Ensure there are no air bubbles in the Buffer Tube.

5 Insert the Buffer Tube into the buffer slot on the LabChip GX Touch/GXII Touch instrument.

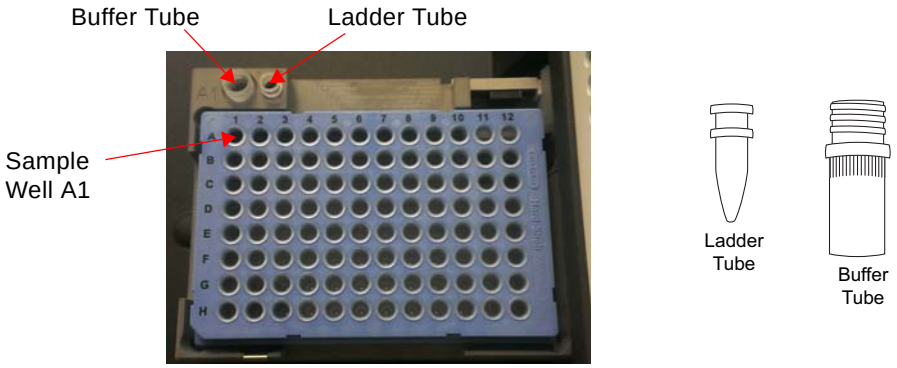

Figure 2. Locations of the Buffer Tube and Ladder Tube in the GX Touch/GXII Touch instrument.

Preparing the Chip

1 Allow the chip to come to room temperature.

2 Use a pipette tip attached to a vacuum line to thoroughly aspirate all fluid from the chip wells (see Figure 3). For more details on how to set up a vacuum line see page 33.

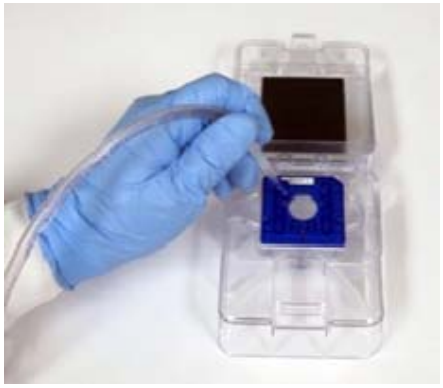

Figure 3. Using a vacuum to aspirate the chip wells is more effective than using a pipette.

3 Rinse and completely aspirate each active chip well (1, 3, 4, 7, 8 and 10) twice with water (Milli-Q® or equivalent). Do not allow active wells to remain dry.

4 If any water spills onto the top and bottom chip surfaces during rinsing, aspirate using the vacuum line. DO NOT run the tip over the central region of the detection window. Use the provided Detection Window Cleaning Cloth dampened in water (Milli-Q® or equivalent) or alcohol to clean the chip detection window as needed.

5 Using a reverse pipetting technique, add Gel-Dye solution to chip wells 3, 7, 8 and 10. For Small-batch, add 50 µL per well as shown in Figure 4. For Large-batch, add 75 µL in wells 3, 7 and 8 and 120 µL in well and 10 as shown in Figure 5.

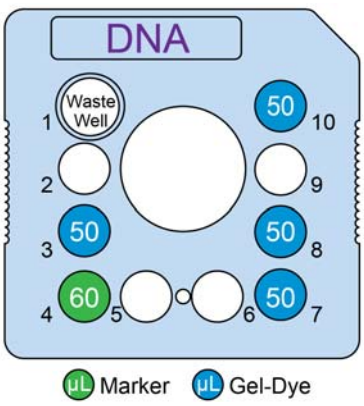

Figure 4. Reagent placement for Small-batch (up to 24 samples).

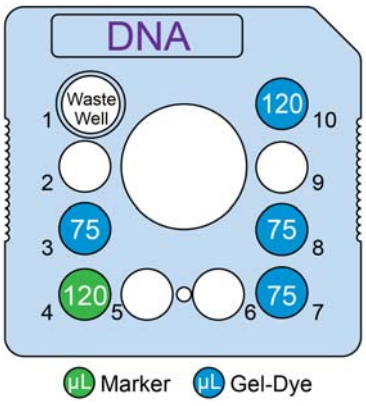

Figure 5. Reagent placement for Large-batch (up to 48 samples).

6 Add 60 µL Genomic DNA Marker (green cap ●) to chip well 4 for Small-batch (Figure 4) or 120 µL for Large-batch (Figure 5).

Note: *The marker well may need to be replenished if the chip is in idle mode on the instrument for an extended period of time.*

7 Make sure the rims of the chip wells are clean and dry.

8 **IMPORTANT:** Ensure chip well 1 (waste well) is empty before placing the chip into the instrument.

Inserting a Chip into the LabChip GX Touch/GXII Touch Instrument

1 Check that the sample plate, Buffer Tube, and Ladder Tube are placed on the instrument properly.

2 Remove the chip from the chip storage container and inspect the chip window. Clean BOTH sides of the chip window with the PerkinElmer-supplied clean-room cloth dampened with a 70% isopropanol solution in DI water.

3 Touch the *Unload Chip* button on the *Home* screen.

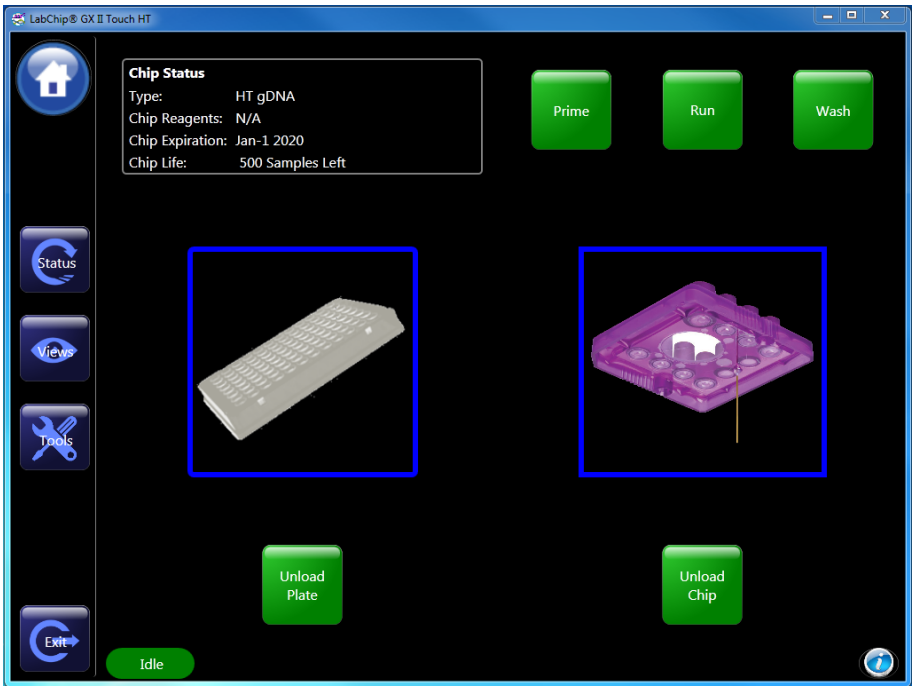

Figure 6. *Home* screen.

4 Insert the chip into the LabChip GX Touch/GXII Touch instrument (Figure 7) and close the chip door securely.

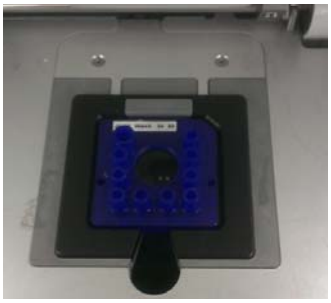

Figure 7. Chip in the LabChip GX Touch/GXII Touch instrument.

5 Touch the *Load Plate* button on the *Home* screen (Figure 6) to retract the sample plate and send the sipper to the Buffer Tube.

Note: *Do not keep the chip door open for any length of time. Dye is sensitive to light and can be photobleached.*

6 The *Assay Choice* window will appear (Figure 8). Touch the desired assay and then touch *OK*.

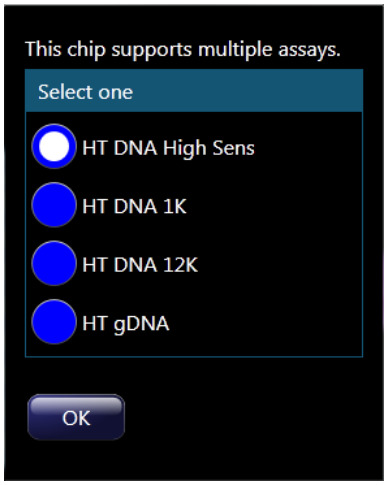

Figure 8. *Assay Choice* menu.

Notes: *The chip may be run with multiple assays, but only one assay type should be run on the chip.*

Be sure to periodically clean the O-rings on the top plate of the chip interface on the LabChip GX Touch/GXII Touch. Use the provided lint-free swab dampened with water to clean the O-rings using a circular motion. Allow the O-rings to dry before inserting a chip.

Running the Assay

Note: *Chips can be primed independently from running assays. Touch the Prime button on the Home screen.* ***Make sure the Buffer Tube is placed on the instrument.***

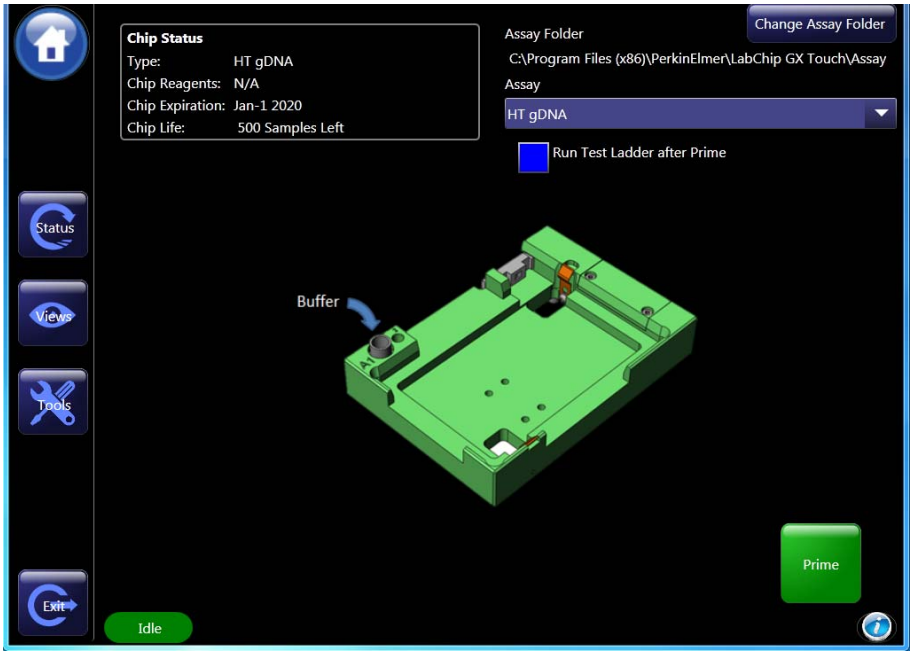

Figure 9. Chip priming screen.

1 Touch the *Run* button (see Figure 9).

2 Select the appropriate assay type (see Figure 8), plate name, well pattern, and whether to read wells in columns or rows. Select number of times each well is sampled under *Adv. Settings* (Figure 10). Touch the *green arrow* button.

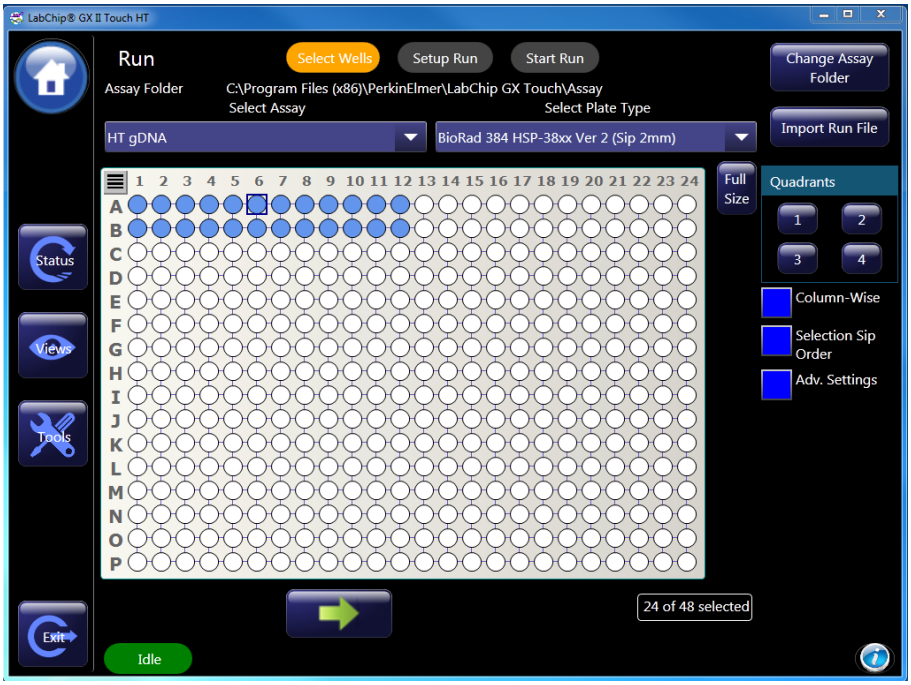

Figure 10. Selecting wells.

3 In the *Setup Run* tab, select the operator name, the option to read barcode, the destination of the file, the inclusion of sample names, expected peaks, and excluded peaks and the filename convention. Select *Auto Export* to export results tables automatically (Figure 11). Touch the *green arrow* button.

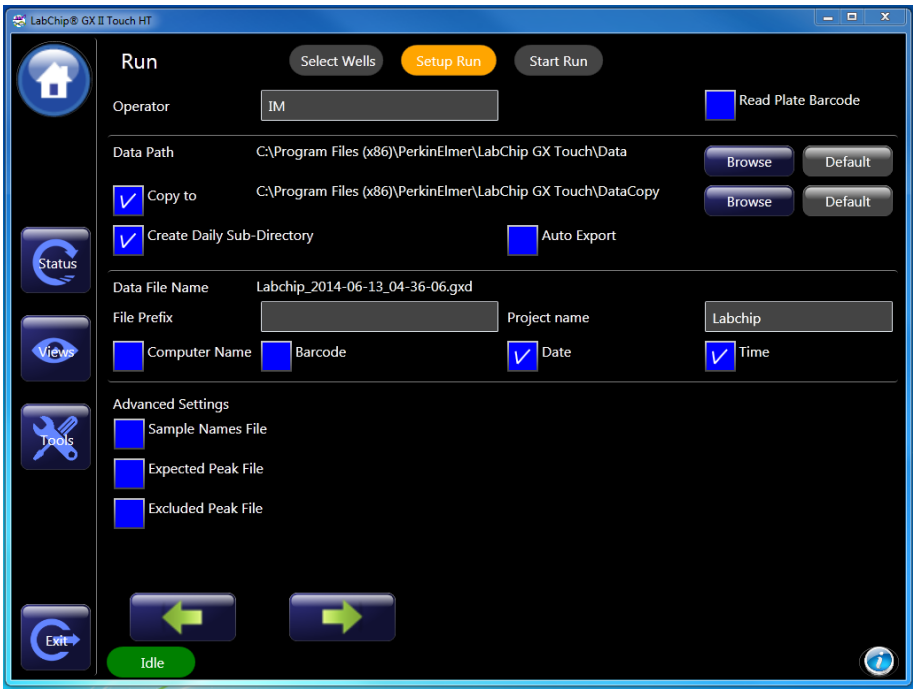

Figure 11. Run setup screen.

4 Touch *Start* to begin the run (Figure 12).

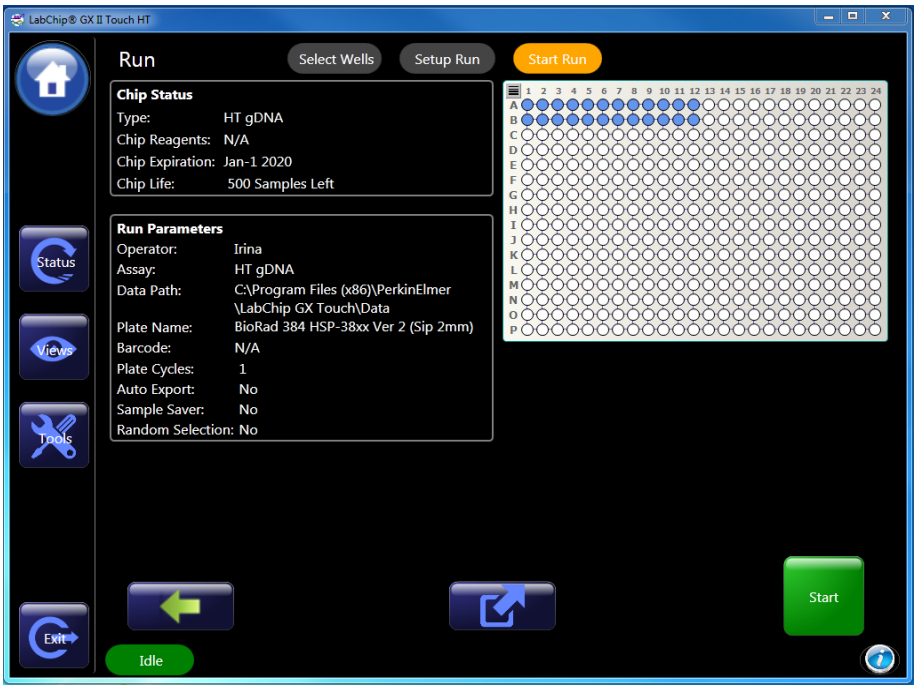

Figure 12. Starting a run.

Storing the Chip

After use, the chip must be cleaned and stored in the chip container. The procedure below can be conducted the following day when running overnight.

1 Place the chip into the plastic storage container. The sipper should be submerged in the fluid reservoir.

2 Remove the reagents from each well of the chip using vacuum.

3 Each active well (1, 3, 4, 7, 8 and 10) should be rinsed and aspirated twice with water (Milli-Q® or equivalent).

4 Add 120 µL of Storage Buffer (white cap ◯) to the active wells.

5 Place the chip in the LabChip GX Touch/GXII Touch instrument and touch the *Wash* button in the upper right corner in the *Home* Screen.

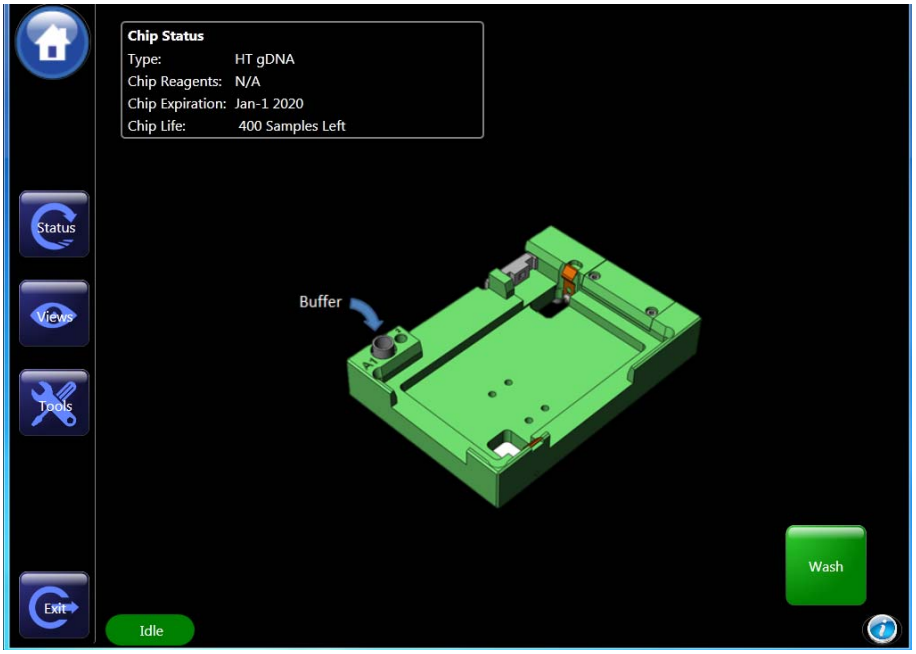

Figure 13. *Wash* screen.

6 Remove the chip from the instrument and place it in the plastic storage container. Add an additional amount of Storage Buffer to well 1.

7 Cover the wells with Parafilm® to prevent evaporation and store at 4°C. Storage of a chip with dry wells may cause it to become clogged.

Chip Cartridge Cleaning

1 Daily

a Inspect the inside of the chip cartridge and O-rings for debris.

b Use the provided lint-free swab dampened with water (Milli-Q® or equivalent) to clean the O-rings using a circular motion. If the O-rings stick to the chip or a pressure leak is detected, perform the more extensive monthly cleaning procedure.

2 Monthly

a To reduce pressure leaks at the chip interface, clean the O-rings frequently. Remove the O-rings from the top plate of the chip interface on the LabChip GX Touch/GXII instrument. Soak O-rings in water (Milli-Q® or equivalent) for a few minutes. Clean the O-ring faces by rubbing between two fingers. Wear gloves.

b To reduce the occurrence of current leaks, clean the chip interface frequently. Clean the top plate of the chip interface using the provided lint free swab dampened with water (Milli-Q® or equivalent).

c Allow the O-rings and chip interface to air dry. Reinsert the O-rings into the chip cartridge.

Results

Genomic DNA Software Analysis

Data are analyzed by aligning the sample data and normalizing the sample area using the Lower Markers in the samples and in the two ladders that bracket every 12 samples. The size of a sample is determined by comparing the migration times of peaks within the sample to those of the fragments of known size in the bracketing ladders. The concentration of a sample is calculated using a Total gDNA smear, starting at 0.18 kb and extending to 300 kb (see Figure 14). These smear limits can be adjusted by the user. A calibration curve generated using the known size and concentrations of ladder peaks are applied to the normalized area of this Total gDNA smear, to determine the concentration of the sample. This Total gDNA Concentration is reported in the Well Table entry of each sample.

The Genomic DNA assay also reports a Genomic DNA Quality Score (GQS) in the Well Table entry of each sample. This score represents the degree of degradation of a sample, with 5 corresponding to intact gDNA and 0 corresponding to highly degraded gDNA, and is calculated from the size distribution of a sample.

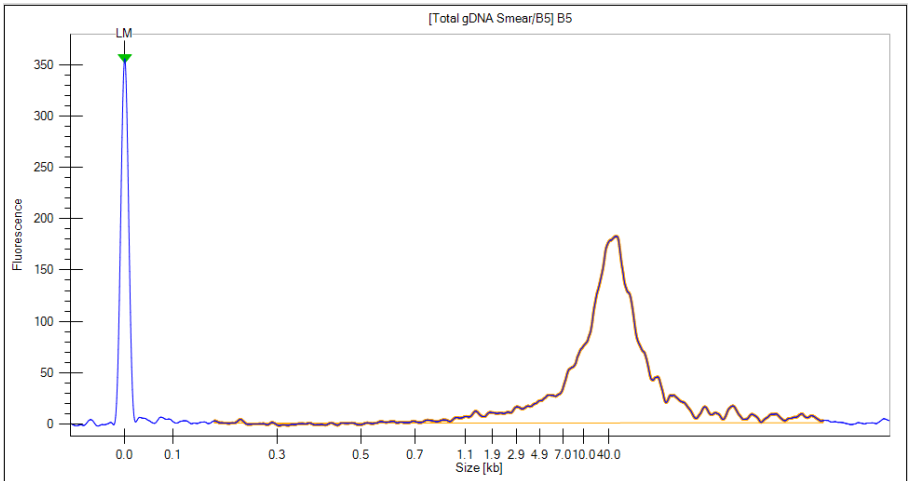

Figure 14. Total gDNA smear (in orange).

Genomic DNA Ladder Result

The electropherogram of a typical Genomic DNA ladder is shown in Figure 15. Following the Lower Marker are ladder fragments of 100, 300, 500, 700, 1100, 1900, 2900, 4900, 7000, 10000 and 40000 bp.

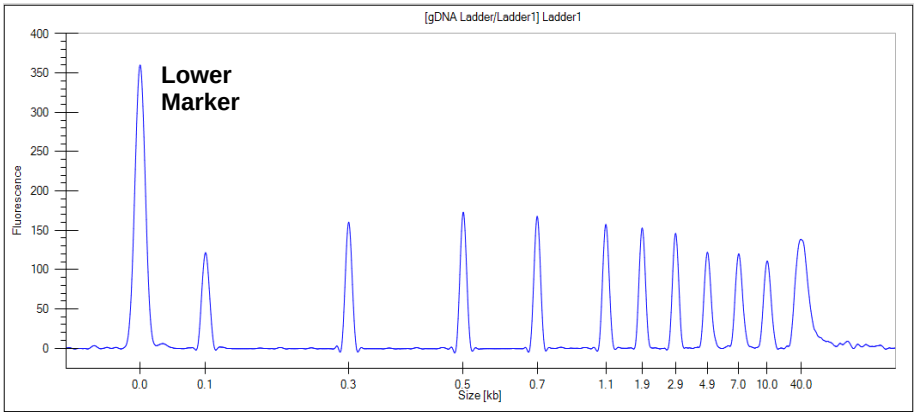

Figure 15. Genomic DNA Ladder.

Genomic DNA Result

An electropherogram and gel view of intact and degraded genomic DNA from BioChain is shown in Figure 16. Genomic DNA was degraded by incubating with Fragmentase® for 10 or 20 minutes. Genomic DNA treated for 10 minutes was partially degraded (GQS = 2.5), while genomic DNA treated for 20 minutes was highly degraded (GQS = 0).

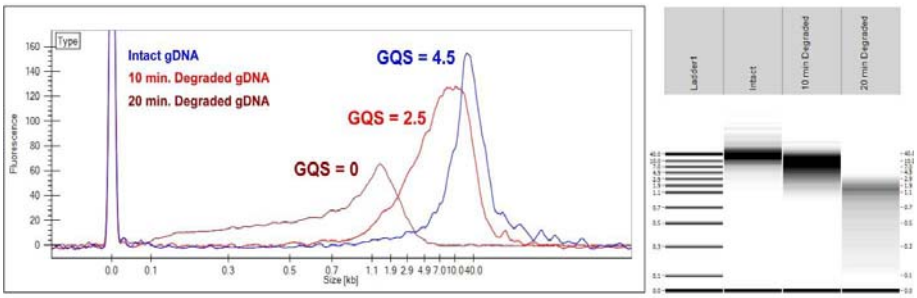

Figure 16. Intact and degraded genomic DNA from BioChain.

Troubleshooting

Note: *Some of the data examples shown in this section were generated with assays other than the assay described in this user guide.*

Symptom: Unexpected concentration and/or GQS.

Possible causes and what to do:

1 If an unexpected concentration and/or GQS value is obtained, check the baseline of gDNA smear for a proper fit. Baselines can be manually adjusted by clicking and dragging.

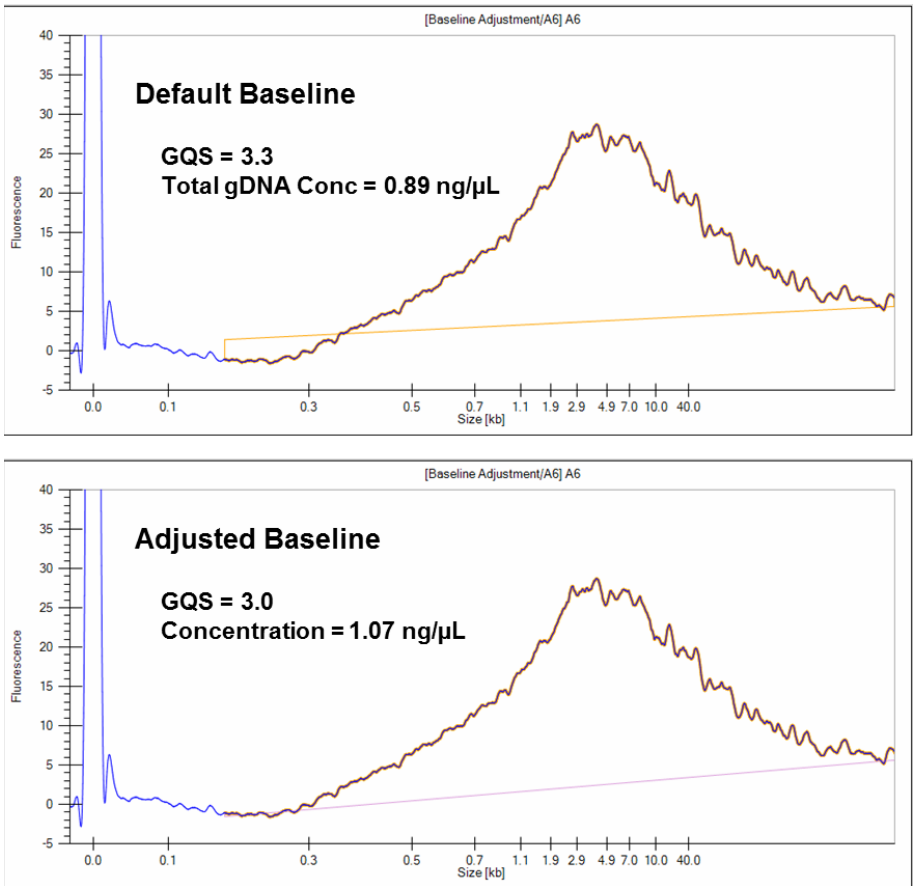

Figure 17. Electropherograms of sample with a poor baseline fit and an adjusted baseline.

Symptom: No ladder or sample peaks but marker peaks detected.

Note: *The lower marker peak height will most likely be greater than normal height.*

Possible causes:

1 Air bubble in sipper introduced during chip priming.

What to do:

1 Reprime the chip. See “LabChip Kit Essential Practices” on page 27 for instructions on how to reprime the chip.

Symptom: Missing sample, ladder *and* marker peaks.

Possible causes:

1 Clog in sipper or marker channel of chip.

What to do:

1 Reprime the chip. See “LabChip Kit Essential Practices” on page 27 for instructions on how to reprime the chip.

Symptom: Ladder detected but no sample peaks.

Possible causes:

1 The sipper is not reaching the sample due to low sample volume in the well of the plate.

2 If the missing sample peaks occurred only in a few wells of the plate, check those wells for air bubbles.

3 The sipper is not reaching the sample due to an incorrect capillary height setting or incorrect plate definition.

4 If the plate has been uncovered for some time, sample evaporation might have occurred.

5 Debris from the sample or sample prep is clogging the sipper.

What to do:

1 Add more sample to the well.

2 Manually insert a larger volume pipette tip (~100 µL) into the sample well and dislodge the bubble. Rerun these sample wells.

3 Check the plate definitions.

4 Check the sample wells, especially around the edge of the plate where evaporation is fastest, and make a fresh plate if volumes are low.

5 If you suspect there may be debris in your samples, spin the sample plate down in a centrifuge (e.g. 3000 rcf for 5 minutes). Unclog the sipper by repriming the chip. See “LabChip Kit Essential Practices” on page 27 for instructions on how to reprime the chip.

Symptom: No ladder peaks but sample peaks and marker peaks are present.

Possible causes:

1 Low or no ladder volume in the Ladder Tube.

What to do:

1 Add more ladder to the Ladder Tube and restart the run. Recommended standard ladder volume is 120 µL (minimum volume is 100 µL).

Symptom: No marker peaks but sample peaks are present.

Possible causes:

1 No marker added to chip well 4.

2 If there is marker solution in chip well 4, the problem may be due to a marker channel clog.

What to do:

1 This may be due to not filling marker well or chip remaining idle on instrument for extended period of time. Add or replenish the marker solution in the chip using the following procedure:

- Touch the *Unload Chip* button on the Home screen to open the chip door.
- Return the chip to the chip container ensuring the sipper is immersed in fluid.
- Thoroughly aspirate all fluid from chip well 4 using a vacuum line.
- Ensure that chip well 4 is rinsed and completely aspirated twice with water (Milli-Q® or equivalent).
- Add Marker Solution (green cap) to chip well 4.
- Reinsert the chip back into the instrument.
- Restart the run.

2 Perform a marker channel unclogging procedure by repriming the chip. See “LabChip Kit Essential Practices” on page 27 for instructions on how to reprime the chip.

Symptom: Ladder traces show up in the lanes following the ladders (delayed sip).

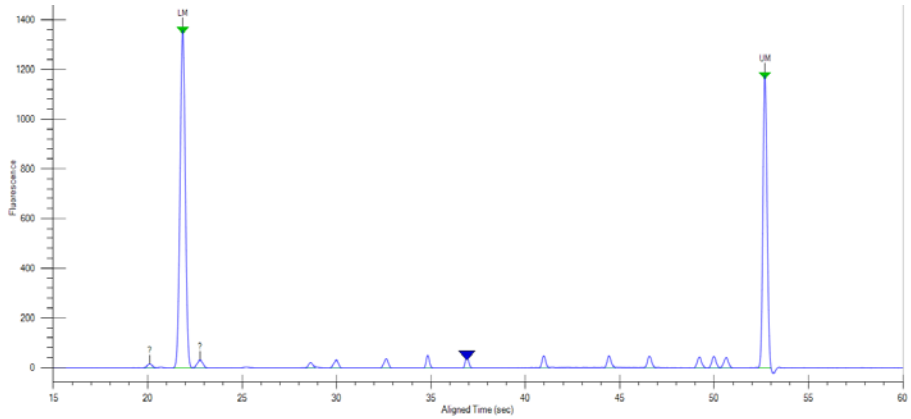

Figure 18. Small ladder peaks in sample well caused by delayed sip.

Possible causes:

1 Separation channel overloaded with sample.

2 Partial clog in the separation channel.

What to do:

1 Lower the starting sample concentration.

2 Reprime the chip. See “LabChip Kit Essential Practices” on page 27 for instructions on how to reprime the chip.

Symptom: Unexpected sharp peaks.

Electropherograms of genomic DNA are shown in Figure 19 and Figure 20 with unexpected sharp peaks caused by particulates (like dust) or aggregates of large DNA that can form during sample loading and/or migration in the chip.

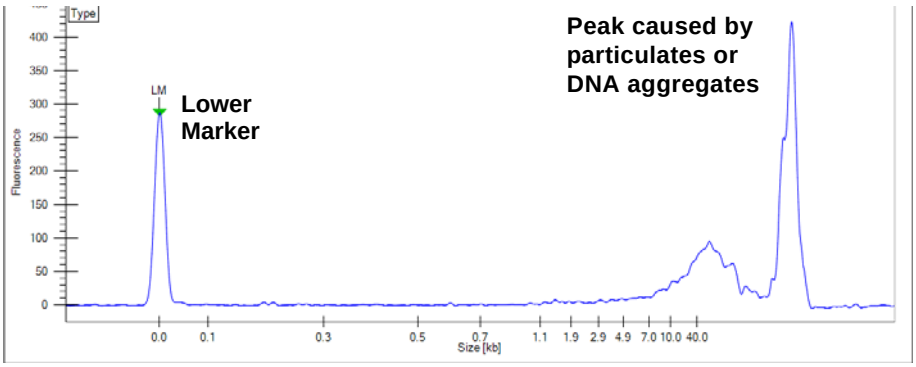

Figure 19. Electropherogram with an unexpected peak migrating after a genomic DNA sample.

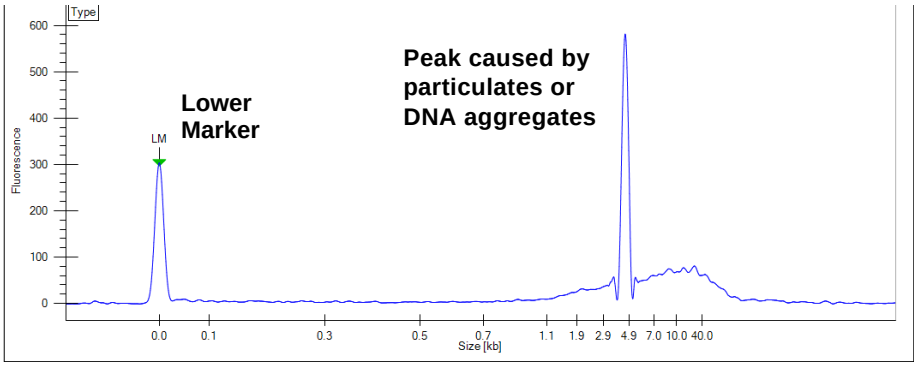

Figure 20. Electropherogram with an unexpected peak that overlaps with the migration of a genomic DNA sample.

Possible causes:

1. Dust or other particulates introduced through sample or reagents.
2. Aggregates of large genomic DNA.

What to do:

1. Replace the buffer used for sample and reagent preparation. Use a 0.22-micron filter for all water and buffers used for chip, sample, and reagent preparation.
2. Retest the sample. Dilute sample further, if possible, to reduce aggregation.

Symptom: Humps in several electropherograms which do not correspond to sample data.

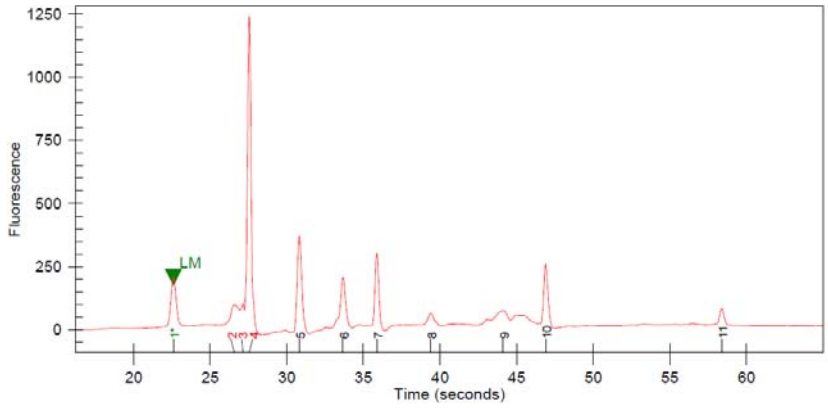

Figure 21. Humps in several electropherograms.

Possible causes:

1 Electrode 7 is dirty and has contaminated the Gel-Dye mixture in well 7.

What to do:

1 Before restarting the run, clean electrode 7. Remove the chip and follow the electrode cleaning procedure. We recommend using the provided swab and isopropanol to manually clean electrode 7.

Symptom: Peaks migrating much faster than expected.

Note: *Some migration time variance between chips or within a plate is considered normal chip performance. All chips are QC tested at PerkinElmer prior to shipment*

Possible causes:

1 Incorrect Gel-Dye concentration.

What to do:

1 Migration time is sensitive to dye concentration and peaks will migrate too fast or too slow if the dye concentration in the gel is too low or too high, respectively. Prepare a fresh Gel-Dye solution. Wash and reprime the chip with the new Gel-Dye mixture.

2 If fast migration is observed repeatedly on a new chip, contact Technical Support.

Symptom: Peaks migrating much slower than expected.

An electropherogram of a genomic DNA sample is shown in Figure 22 where the migration time is much longer than expected.

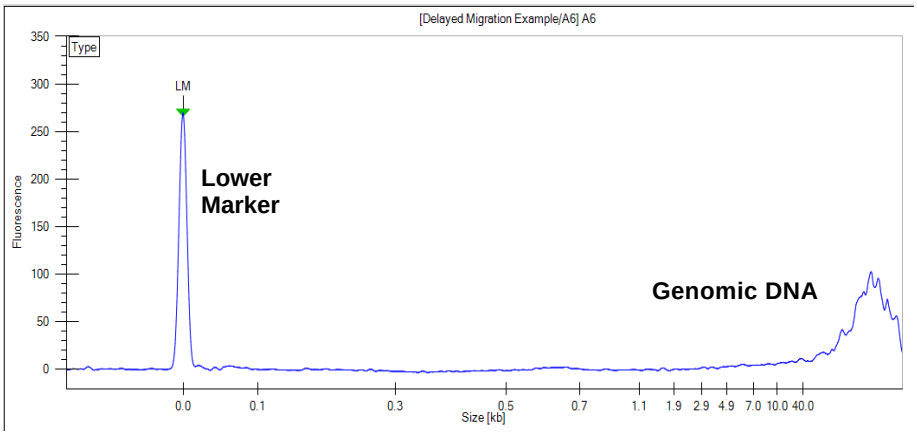

Figure 22. Electropherogram of genomic DNA migration that is too slow.

Possible causes:

1. Particulates from the samples may be clogging the separation channel.
2. Excess dye within the separation channel.
3. Gel-Dye was not primed properly into the chip.

What to do:

1. Minimize the loading of particulates in the sample by spinning down the plate (e.g. 3000 rcf for 5 minutes) before testing and/or selecting a plate type with a higher sip height in the Start Run dialog box before starting a new run. The debris maybe flushed out of the chip by washing and repriming the chip.
2. Prepare a fresh Gel-Dye solution. Wash the chip and then reprime with the new Gel-Dye mixture.
3. Check the O-rings on the top surface of the chip interface and clean if necessary, then reprime the chip.

LabChip Kit Essential Practices

To ensure proper assay performance, please follow the important handling practices described below.Failure to observe these guidelines may void the LabChip Kit product warranty.[1]

Note: *It is important to keep particulates out of the chip wells, channels and capillary. Many of the following guidelines are designed to keep the chips particulate-free.*

For assay and instrument troubleshooting, refer to the LabChip GX Touch software Help file or call PerkinElmer Technical Support at 1-800-762-4000.

General

- Allow the chip, sample plate and all reagents to equilibrate to room temperature before use (approximately 20 to 30 minutes).
- Clean the O-rings in the chip interface weekly and the electrodes daily. Refer to the Instrument Users Guide Maintenance and Service section for procedures.
- Avoid use of powdered gloves. Use only non-powdered gloves when handling chips, reagents, sample plates, and when cleaning the instrument electrodes and electrode block.
- Calibrate laboratory pipettes regularly to ensure proper reagent dispensing.
- Only the PerkinElmer-supplied clean room cloth can be used on the chip to clean the detection window.
- Water used for chip preparation procedures must be 18 megohm, 0.22-µm filtered water (Milli-Q® or equivalent).
- Using the “Reverse Pipetting Technique” (described next) will help avoid introducing bubbles into the chip when pipetting the gel.

1. PerkinElmer, Inc. warrants that the LabChip Kit meets specification at the time of shipment, and is free from defects in material and workmanship. LabChip Kits are warranted for 90 days from the date of shipment. All claims under this warranty must be made within thirty days of the discovery of the defect.

Reverse Pipetting Technique

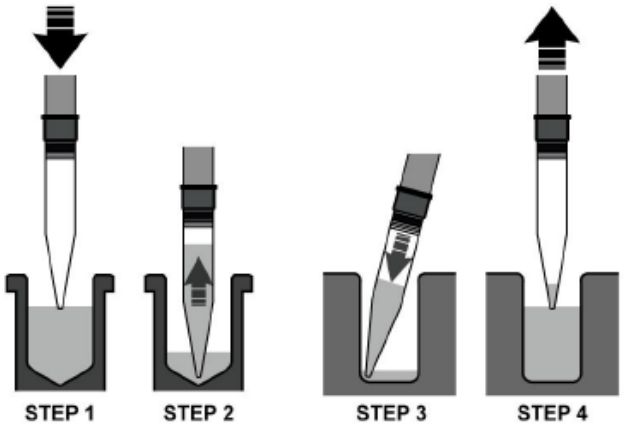

Figure 23. Reverse pipetting.

1. Depress the pipette plunger to the second stop.
2. Aspirate the selected volume plus an excess amount from the tube.
3. Dispense the selected volume into the corner of the well by depressing plunger to the first stop.
4. Withdraw the pipette from the well.

Reagents

- Store reagents at 4°C when not in use.
- The LabChip dye contains DMSO and should be thawed completely before use. It is recommended that you prepare aliquots to reduce the time required for thawing.
- Gently vortex all kit reagents before use.
- Dispense reagents into chip wells slowly without introducing air bubbles. Insert the pipette tip vertically and to the bottom of the chip well.
- Protect the dye and Gel-Dye mixture from light. Store in the dark at 4°C when not in use.
- The Gel-Dye mixture expires 3 weeks after preparation.

Chips

Repriming Chips

Note: *Buffer tubes filled with 1X DNA sample buffer or water should be placed into the instrument while priming or washing chips.*

- Touch the *Unload Chip* button on the *Home* screen to open the instrument door. Place the chip into the instrument.
- Close the chip door securely and choose the corresponding assay.
- Touch the *Prime* button on the *Home* screen to reprime the chip.

Washing and Repriming Chips

- Touch the *Unload Chip* button on the *Home* screen to open the instrument door.
- Return the chip to the chip container ensuring the sipper is immersed in fluid.
- Thoroughly aspirate all fluid from the chip wells using a vacuum line.
- Ensure that each active well (1, 3, 4, 7, 8 and 10) is rinsed and completely aspirated twice with water (Milli-Q® or equivalent). Do not allow active wells to remain dry.
- Add 120 µL of Storage Buffer to each active well (1, 3, 4, 7, 8 and 10).
- Place the chip in the LabChip GX Touch/GXII Touch instrument.
- Close the chip door securely.
- Touch the *Wash* button on the *Home* screen (Figure 24).

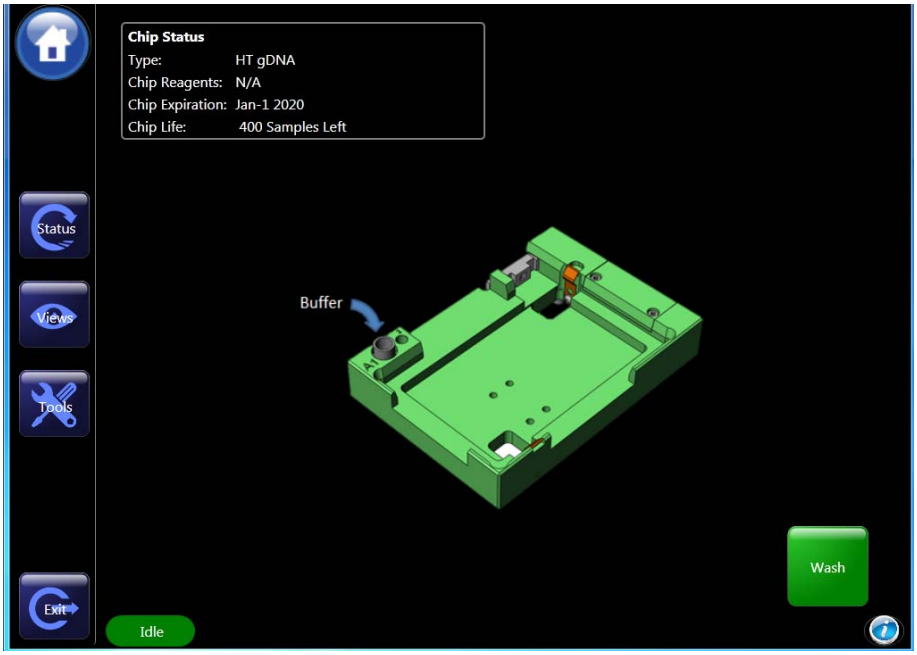

Figure 24. *Wash* screen.

- After the completion of the wash cycle return the chip to the chip container ensuring the sipper is immersed in fluid.
- Thoroughly aspirate all fluid from the chip wells using a vacuum line.
- Ensure that each active well (1, 3, 4, 7, 8 and 10) is rinsed and completely aspirated twice with water (Milli-Q® or equivalent). Do not allow active wells to remain dry.
- Add Gel-Dye solution to chip wells 3, 7, 8 and 10 using a Reverse Pipetting Technique as shown in Figure 23.
- Add 60 µL (Small-batch) or 120 µL (Large-batch) DNA Marker (green cap ●) to chip well 4. Please note that the marker well may need to be replenished if the chip is in idle mode on the instrument for an extended period of time.
- Place the chip into the LabChip GX Touch/GXII Touch instrument.
- Close the chip door securely.
- Touch the *Run* or *Prime* button on the *Home* screen.

- If air bubbles are not dislodged after a reprime, apply a vacuum to the sipper. Perform this by filling all active wells with 100 µL of Chip Storage Buffer. Then suction the sipper with a vacuum line as shown in Figure 25 until droplets of fluid flow out from the sipper. When suctioning the sipper, be careful not to bend or break the sipper. To facilitate this, cut the end of the pipette tip attached to the vacuum line to widen the mouth.

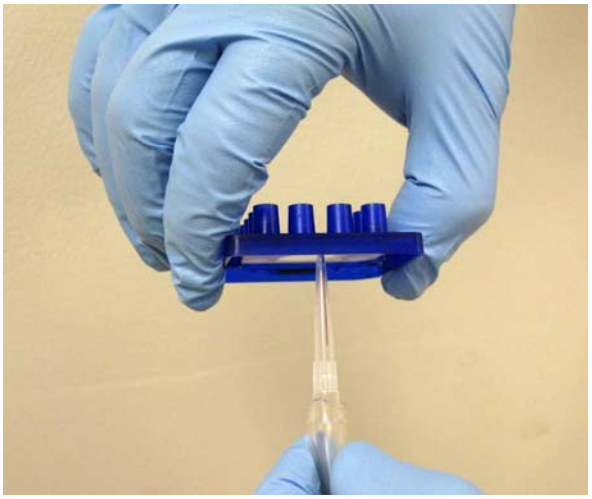

Figure 25. Removing an air bubble or clog by suctioning the sipper with a vacuum line.

Other Considerations:

- Chips should be stored refrigerated.
- Cover the active wells on the chip with Parafilm® and store at 4°C. If using the chip again within 24 hours it may be left at room temperature.
- Do not allow the liquid in the chip container to freeze, as this may lead to poor chip performance. Do not submerge the chip in any solution.
- The entire chip surface must be thoroughly dry before use.
- The sipper must be kept immersed in fluid at all times and should not be exposed to an open environment for long periods of time.
- Use care in chip handling to prevent sipper damage. Damage to the sipper can result in inconsistent sampling.
- Avoid exposing the chips to dust by keeping them in a closed environment such as in the chip container or in the instrument before and after chip preparation.

- Chips can be prepared and left idle on the instrument for up to 8 hours. This workflow allows analysis of samples as needed throughout the day without having to re-prep the chip as long as the maximum number of samples per chip prep is not exceeded.
- PerkinElmer recommends the chip be re-prepared after it has been idle for 8 hours.

Samples

- Prepared sample plates should be free of gas bubbles and particulate debris, both of which may inhibit sipper flow.
- Sample plates containing gas bubbles and/or particulate debris should be spun down at 3000 rpm (1250 rcf) prior to analysis.
- Up to 96 samples in a 96-well or 384-well plate can be run with a single chip preparation.

Chip Well Aspiration Using a Vacuum

Aspirating with a pipette can leave used reagents in the chip wells. For this reason, PerkinElmer recommends vacuuming the wells instead. This can be accomplished by attaching a permanent pipette tip to a house vacuum line with trap (Figure 26). To avoid contamination, use a new disposable pipette tip over the permanent tip for each chip aspirated (Figure 27).

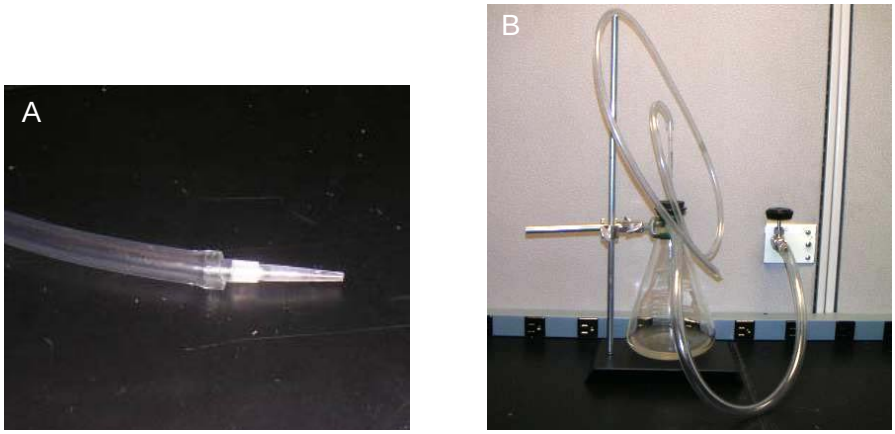

Figure 26. A: Permanent pipette tip attached to a house vacuum line; B: vacuum line with trap.

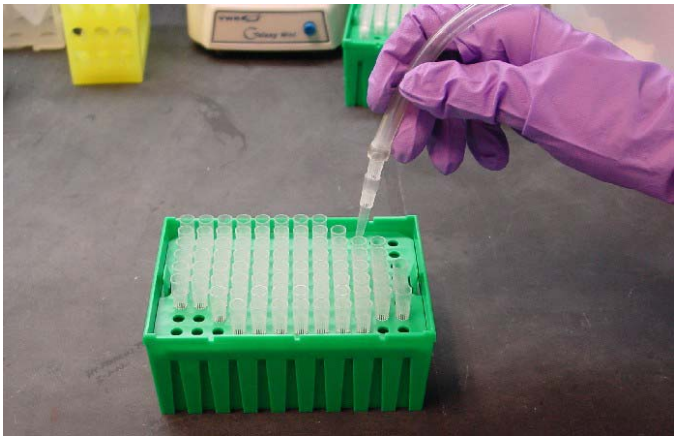

Figure 27. Replacing the disposable pipette tip.

Customer Technical Support

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Internet: www.perkinelmer.com

For additional assay and instrument troubleshooting, refer to the LabChip GX Touch Software Help file.

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